

ARGUMENTS/REMARKS

Favorable consideration of this application in light of the following discussion is respectfully requested.

Claims 3-6 are pending in the application.

In the outstanding Office Action, Claims 3-6 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Nakamura et al. (U.S. Patent No. 5,740,168) in view of Adachi (U.S. Patent No. 6,084,884).

Briefly recapitulating, Claim 3 is directed to a radio communication method of a base station controlling apparatus used for a radio communication system including a plurality of base stations and a plurality of mobile stations, employing CDMA (Code Division Multiple Access) for radio access and providing multi-rate transmission. The radio communication method includes transmitting code information by message to one of the plurality of base stations, said code information for switching a first code being used to a second code, so as to enable the one of the plurality of base stations to transmit timing information by message and to switch the first code to the second code based on the code information transmitted. The switching at the one of the plurality of base stations is conducted in synchronization with the switching of the first code to the second code at the one of the plurality of mobile stations, the one of the plurality of mobile stations switching the first code to the second code based on the timing information transmitted by the one of the plurality of base stations. The timing information includes an integer representing a frame at which the first code is switched to the second code. Claims 4-6 are directed to alternative embodiments, each reciting steps of switching on the basis of timing message. The timing messages ensure accurate synchronization of the base station and mobile.¹

¹ Specification, paragraphs 121-128.

Nakamura describes a method for code switching, including the transmission of a timing signal from a base station to a mobile station.² However, Nakamura does not disclose or suggest transmitting a timing message as recited in Applicants' Claims 3-8. That is, in Nakamura, the timing information is not a Layer 3 timing message but is merely Layer 1 bit data or a Frame number.³ Further details distinguishing the Layer 1 communications of Nakamura and Applicants' claimed Layer 3 message follow.

Regarding Applicants' claimed limitation of "by message," Applicants note that in Nakamura, "switching timing information" is transmitted between a base station and a mobile equipment by using Layer 1 bit data.⁴ It means the information is mutually transmitted/received by being expressed on the physical medium (Layer 1). On the other hand, in the present application, as shown in Fig. 1, a cable line is used between the base station control unit and the base station (section A) and a radio line is used between the base station and a mobile equipment (section B). That is, different physical mediums are used between the section A and the section B in the present application. Therefore, in the case of directly notifying information from the base station control unit to a mobile equipment (section C) as performed in the sequence of Figs. 5, 9, and 10, it needs to go through two different physical mediums. Accordingly, it is apparent that the notification between the base station control unit and the mobile equipment is not by Layer 1 information. Furthermore, since the information notification between the base station control unit and the mobile station is not by Layer 1 information, it is apparent for the present application that information notification between the base station control unit and the base station or between the base station and the mobile equipment is also not by Layer 1 information. Therefore, the informational notification performed in the sequence of Figs. 5, 9, and 10 is not by

² Nakamura, Figures 4, 20B, and 25.

³ Nakamura, column 8, lines 14-26; column 16, lines 31-46.

Layer 1 information.

Moreover, the term "message" is generally used by one skilled in the art as representing Layer 2 or higher than Layer 2. For example, in Section 5.1 "Overall protocol structure" of 3GPP TS 25.301 in the Standard of 3GPP (attached hereto) describes that the RRC specified for Layer 3 generates "signaling messages" and "NAS messages." Further, as another example, as described in attached translations of a technical book and two Japanese patent publications, in ISDN (being substantially the same net protocol as the present application), Layer 3 (network layer) information used for performing call control is generally called "message." That is, call control, such as call setting, responding and disconnecting performed among a calling side, the net, and a called side is realized by transmitting/receiving messages.

According to the above stated, it can be concluded that the message for transmitting information (request) in the present application means not Layer 1 but Layer 2 or higher than Layer 2. That is, both the "code information" and "timing information" in the claim are transmitted "by message" of Layer 2 or higher than Layer 2.

Furthermore, Applicants' claimed invention provides an unexpected result as explained below. In Nakamura, switching timing information prepared in each frame can be generally provided by Layer 1 bit data.⁵ Layer 1 is a layer which specifies a transmission method of a bit stream in a communication media (a radio line in Nakamura). Therefore, each of specific bit in Layer 1 has special meaning. For example, switching timing is set up as follows: a flag of a specific frame is made to indicate a state of ON or OFF, and simultaneous radio line switching timing of a base station and a mobile station is set up after a predetermined period from the frame whose flag is ON. For instance, if a bit specified in

⁴ Nakamura, column 8, lines 14-18

⁵ Id.

time beforehand is 1, "switching is performed" and if the bit is 0, "switching is not performed". Usually, since Layer 1 is composed of hardware, it cannot be easily changed. Therefore, in order to perform switching after a plurality of frames, it is necessary to secure enough number of bits in advance in order to express the maximum number that indicate what number frame from the frame having a state of ON triggers switching code, on the physical medium, which causes inefficiency.

On the other hand, by way of Applicants' claimed notifying by message, it is possible to transmit information to a communication partner's apparatus based on a frame structure defined by Layer 2 on bit stream provided by Layer 1, and possible to have the frame number to be switched after a plurality of frames as mentioned above, as an information element in the message. Regarding this, specific bits on the physical medium of Layer 1 don't have information of switching timing. For this reason, in the case of specification changing such as changing the maximum number, since it is necessary to change the hardware, meaning the structure for Layer 1 of mobile equipments and the base station, hardware of all the mobile equipments on the market needs to be changed. On the other hand, hardware is not affected in the present application.

Furthermore, in the case of using "message" as the present application, the function increasing certainty of data transmission between apparatuses such as an error correction and a resend control provided by Layer 2 can be applied. In the case of Layer 1 bit, if an error is generated on a radio line, influence of the error will directly affect operations (it means to error a switching timing in the above-mentioned example). However, in the message of Layer 3, since the function of Layer 2 is applied, a bit error in Layer 1 can be corrected or detected to be resent, which increases reliability of data transmission (information which indicates timing for generating switching in the above-mentioned case).

Consequently, the invention recited in Applicants' claim 1 transmit "code

information" and "timing information" to one of a plurality of terminals by message where the message is not a Layer 1 construct and which is different from using Layer 1 bit data.

Applicants have considered the Adachi reference and submit Adachi does not cure the deficiencies of Nakamura. As none of the cited prior art, individually or in combination, disclose or suggest all the elements of independent Claims 3-6, Applicants submit the inventions defined by Claims 3-6 are not rendered obvious by the asserted references for at least the reasons stated above.⁶

Accordingly, in light of the previous discussion, Applicants respectfully submit that the present application is in condition for allowance and respectfully request an early and favorable action to that effect.

Respectfully submitted,

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⁶ MPEP § 2142 "...the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)."

Attachment A

Translated Extracts of Technical and Patent Publications

(a) "OSI&ISDN Illustrated Term Dictionary" by Kinii Ono et al. Ohmsha Ltd. (1989)

ISDN USER - NET INTERFACE (3)

PROTOCOL STRUCTURE

P 98 (lines 22 - 28)

Layer 3 of "ISDN User - Net Interface" specifies information on the D channel transmitted between the user and the net by Layer 1 and Layer 2, and a procedure using the information (CCITT Recommendation I.451). The information on the D channel specified by Layer 3 is called a message, and used for call control such as calling and cutting the calling. One message is composed of a plurality of information elements in order to indicate contents relating to the call control. By transferring this message onto the D channel, call control of line change can be performed.

(b) Japanese Unexamined Patent Publication No. JP5-28423

[0048] In the I Interface, a signal of Layer 3 of the procedure (LAPD) on the D channel is called a message, and composed of a common part and an individual part as shown in Fig. 16 (a). The common part is commonly included in all the messages (that is, all the signals) and composed of three elements; a protocol discriminator, a call reference, and a message type.

(c) Japanese Unexamined Patent Publication No. JP5-32793A

[0004] ISDN service started in Japan in 1988, and is going to prevail from now on. In ISDN, things specifying connection conditions at the border point (restriction point) in the case of connecting a terminal with a network are called "User • Net Interface", and specified by CCITT as I.400 Series Recommendation. The ISDN service is controlled by information of Layer 3 (Network Layer), and the information of Layer 3 is generally called a message. Call control is realized by sending/receiving messages such as call setting, responding and disconnecting performed among a calling side, the net, and a called side.

(d) 3GPP TS 25.301 V3.11.0 (Pages p.1 - p.10 of English Documents are attached hereto.)